

## **The Stress Mess: How Stress Impacts Health**

Presented by:  
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### Agenda

- Introduction
- Physiology of Stress
- Stress and Disease
- Stress and Dental Disorders
- Stress and Nutrition
- Stress and Gender
- Stress Busters

What is STRESS??? Stress is the way we react physically, mentally, and emotionally to various conditions, changes, and demands in our lives

Our minds react with concern, worry, or fear

Our bodies react by secreting stress chemicals and hormones

The physiological stress circuit existed in primitive humans as a mechanism to ensure the survival of our species

**Headliners: Brain is equipped to register fear and worry more sensitively than any other emotion**

Nature does not consider happiness essential for survival

Only attached intense pleasure to procreation and eating because they are necessary for survival

Normal reaction to life for ALL people of ALL ages

Stress is Ageless: Stress affects anyone--children included--who feels overwhelmed

Stressors for children are quite different than those of adults

Early childhood stress can and does lead to adult stress

The top four Stressors for children are:

- School
- Family
- Peer pressure
- World concern

In this current world, stress from relationships, financial problems, the evening news, our daily commute, or from our work seems to increase and decrease but rarely ceases

Changes in our world—technological advances, ‘multi-tasking’, breakdown of the extended family—has shifted the nature and pattern of stress-inducing events

When stressors are relatively acute but infrequent, our bodies have an opportunity to clear the stress hormones and return to more baseline or ‘normal’ conditions

Positive stress (**eustress**) can challenge us to act in creative and resourceful ways—in fact, too little stress can be bad for us, since stress can motivate us to do our best

Over brief periods of time, mild to moderate levels of stress can produce beneficial results

Since concentration is more focused, actors, musicians and others find that their performances are often enhanced by this stress-induced effect

In addition to activating the mind and improving concentration, stress hormones increase muscle function and speed reaction time—a definite plus for athletes and others striving for heightened physical performance

However, when stressors are as frequent and as pervasive as they seem to be in our modern world, our bodies do not have enough time to reverse the harmful physiological effects

Often we cannot fight nor can we flee—we feel trapped and helpless

### **Symptoms of Stress**

According to the Harvard Medical School Family Health Guide, symptoms of chronic stress can affect us physically, behaviorally, emotionally, and cognitively

Physical symptoms of stress include:

- Headache
- Backache
- Indigestion
- Tight neck and shoulders
- Racing heart
- Tremors/Nervous tics
- Xerostomia
- Lethargy/Fatigue
- Bruxism
- Skin disorders
- Susceptibility to illness
- Heartburn/GI upset

Behavioral symptoms include:

- Increased smoking, alcohol or drug intake
- Compulsive eating
- Inability to get things done
- Reappearance or aggravation of phobias
- Avoidance of people or places
- Relationship problems
- Increased caffeine intake
- Impulsivity
- Overeating
- Bossiness

Emotional symptoms include:

- Crying
- Nervousness
- Edginess
- Loneliness
- Sense of powerlessness
- Low self-esteem
- Anger
- Guilt
- Suspicion
- Fear of failure
- Feelings of impending doom

Cognitive symptoms include:

- Trouble thinking clearly
- Forgetfulness
- Inability to make decisions
- Thoughts of escape
- Easily distracted
- Low threshold of frustration
- Anxiety and fears
- Lack of creativity
- Incessant worrying

According to the National Mental Health Association, 75 to 90% of all doctor's appointments are related to stress

75% of Americans experience 'great stress' at least once weekly; 33% report feeling stressed significantly more than twice weekly

One million employees are absent on an average workday due to stress-related symptoms

Because most physicians do not have the time or resources to help discover and eliminate the sources of stress, they often prescribe medication—which can be addicting

Health problems attributed to job stress are estimated to cost businesses in the U.S. \$150 BILLION annually

Stress is being linked to heart disease, immune deficiency, memory loss, diabetes, periodontal diseases, pre-term/low-weight births, AND MORE!

**Common sources of Stress:**

- Environment
- Social stressors
- Physiological source
- Thoughts
- Belief System
- Infection\*\*\*\*

**The Tyranny of Choice**

Logic suggests that having options allows people to select precisely what makes them happy...

But, as studies show, abundant choice often makes for misery

Americans today choose among more options in more parts of life than has EVER been possible before

Assessments of well-being by various social scientists reveal that increased choice and increased affluence have, in fact, decreased well-being in the U.S. and most other affluent countries

As the gross domestic product more than doubled in the past 30 years, the proportion of the population describing itself as 'very happy' declined by more than 5%

More of us than ever are clinically depressed

Of, course, no one believes that a single factor explains decreased well-being, but a number of findings indicate that the explosion of choice plays an important role

A point is reached at which increased choice brings increased misery rather than increased opportunity—it appears that American society has long since passed that point

An example: In 1970, there was one kind of oreo cookie—the same one that has been around since 1912

In 2006, there were 35 varieties—including a 'spring' version with purple filling

**Let's look at some poor decision-making skills...**

A man walked in to a Topeka, KS Kwik Shop and asked for all the money in the register

Apparently, the take was too small, so he tied up the store clerk and worked the counter himself for 3 hours until police showed up and grabbed him

More than 600 people in England wanted to ride a spaceship badly enough to pay \$10,000 a person for the first tourist flight to Mars

According to police, the would be travelers were told to spend 'their next vacation on Mars—amid the splendors of ruined temples and painted deserts...ride a Martian camel from oasis to oasis and enjoy the incredible Martian sunsets...explore mysterious canals and marvel at the views'

A little added incentive: 'Trips to the moon also available'

Authorities believe the con men running this scam made off with more than \$6 million

Police in Los Angeles had good luck with a robbery suspect who just could not control himself during a line-up

When detectives asked each man to repeat the words: 'Give me all your money or I'll shoot', the man shouted, 'That's not what I said!'

**The importance of science**

When making patient treatment and home care recommendations, we depend on scientific investigation

All scientific endeavors depend on the TRUTH of investigative research

Amid recent examples of dishonesty within the business sectors, is truth an endangered virtue???

**Headliners: The British Medical Journal reported on 'motivational deficiency disorder' ('MoDeD') in their April 1, 2006 issue**

According to the BMJ: 'Extreme laziness may have a medical basis' according to the one of the lead researchers and 'discoverers' of MoDeD—Dr. Leth Argos

In the article, a drug known as 'Strivor' was allegedly so successful in treating the disorder that 'one young man who could not leave his sofa is now working as an investment advisor'

Numerous news outlets picked up the BMJ press release and ran it without a hint of skepticism

The prank did have a purpose; it was designed to bring attention to a conference on so-called ‘disease-mongering’—the medicalization of ordinary conditions which thereby opens markets for therapeutic treatment options

**Headliners: The Ethics of American Youth: 2008 summary; Published by Josephson Institute; 2008**

Following a benchmark survey in 1992, the Josephson Institute has conducted a national survey of the ethics of American youth every two years

Data is gathered through a national sample of public and private high schools—surveys conducted in 2008 had 29,760 respondents

The results paint a troubling picture of our future politicians and parents, cops and corporate executives, and journalists and generals

In bad news for business, more than one in three boys (35 %) and one-fourth of the girls (26%) — a total of 30 % overall — admitted stealing from a store within the past year

More than eight in ten students (83%) from public schools and religious private schools confessed they lied to a parent about something significant

Cheating in school continues to be rampant and it’s getting worse—a substantial majority (64%) cheated on a test during the past year (38% did so two or more times)

As bad as these numbers are, it appears they understate the level of dishonesty exhibited by America’s youth—more than one in four (26%) confessed they lied on at least one or two questions on the survey

Despite these high levels of dishonesty, the respondents have a high self-image when it comes to ethics—a whopping 93% said they were satisfied with their personal ethics and character and 77% said that when it comes to doing what is right, I am better than most people I know

**Headliners: Are You for Real?; Reed Tucker; USA Weekend; 12/28-30/07**

Alibi Network is a service that provides elaborately constructed excuses for its clients—the Chicago-based company can arrange fake airline receipts, non-existent hotel confirmations, and can hire actors to deliver whatever ‘message’ the client might need

Alibi Network charges an annual fee of \$75 on top of service fees ranging from \$75 for a simple phone call to thousands of dollars for more extensive lying

[www.alibinetwork.com](http://www.alibinetwork.com)

**For the me’s, you’s and the public:**

Use of substantial, evidenced-based research in making recommendations for home care strategies and treatment protocols for patient care

Helping our patients make informed choices and decisions about aspects of their oral as well as their overall health is inherent in the dental profession

What is the BEST way to obtain evidenced-based, accurate, unbiased information???

One Great Resource:

University of Rochester Medical Center

Edward G. Miner Library

[www.urmc.rochester.edu](http://www.urmc.rochester.edu)

**Words of Wisdom:** ‘Let us begin by committing ourselves to the truth—to see it as it is, and tell it like it is—to find the truth, to speak the truth, and to live the truth.’--Those words were spoken by Richard Nixon as he accepted the Republican nomination for president in 1968

**History of STRESS**

Since the beginning of time, many humans have identified stress in their lives on a personal, non-scientific manner

In the 4th century B.C., Plato conjectured that “all diseases of the body proceed from the mind or soul”

Early societies consciously explored the phenomena of stress as a result of demonic possession of the body

In 1831, Dr. James Johnson developed a precise description of the physical reaction to stress:

“A sudden gust of passion, a transient sense of fear, an expected piece of intelligence--in short, any strong emotion of mind, will cause the heart to palpitate, the muscles to tremble, the digestive organs to suspend their functions, and the blood to rush in vague and irregular currents through the living machine”

Modern day concept of stress was formulated by pioneering physiologist Walter Cannon in the 1920’s!!!!

Cannon established the basis for the “fight or flight” description of stress

He established that “a complex animal body exhibits a single fundamental pattern of response to any challenge to its equilibrium”

Cannon coined the term “homeostasis”—a term vital to understanding the physiological aspect of balance despite external change

In 1936, **Hans Selye** began to investigate the ‘syndrome of just being sick’

A word or two about Canada’s own Dr. Hans Selye:

Hans Selye (1907 - 1982), a Hungarian-Canadian endocrinologist, may be considered the first to understand, evaluate, and promote the meaning of stress—he even coined the term stress

Selye had begun, as early as his second year in medical school to wonder about internal and external forces on the body—for example, simply flexing a muscle as well as feeling anxious can be considered stress because both exert forces

Selye experimented on mice with various toxins and noticed that even though they developed different diseases they seemed to share some fundamental symptoms

Selye noticed people who ‘felt and looked ill, had a coated tongue, complained of more or less diffuse aches and pains in the joints, and of intestinal disturbances with loss of appetite...[and also] ‘had fever, enlarged spleen or liver, inflamed tonsils, a skin rash’ were demonstrating the symptoms of stress—or the

**General Adaptive Syndrome (‘GAS’)**

Three Stages of GAS:

- Fight or flight response (instantaneous)
- Resistance (extension of fight or flight)
- Exhaustion

Selye also observed that some general medical care seemed to help everyone: easily digestible foods, keeping the room at a comfortable temperature, relaxation etc.

Through experiments, Selye also discovered that changes in the state of human organs were the same despite the source of stress induced on the human body

Notable Quotes by Selye:

- ‘Stress is the spice of life’
- ‘Adopting the right attitude can convert a negative stress into a positive one’
- ‘Man should not try to avoid stress any more than he would shun food, love or exercise’
- ‘Every stress leaves an indelible scar, and the organism pays for its survival after a stressful situation by becoming a little older’
- ‘Its not stress that kills us, it is our reaction to it ‘

The Selye Legacy Lives On!

The **Hans Selye Foundation (‘HSF’)** was created in 1975 by Drs. Pauling, Salk, Toffler and international colleagues in recognition of Dr. Selye's role as ‘the father of the stress field’—HSF focuses on research & development, clinical and preventive applications as well as international academic, clinical and research partnerships

The **Canadian Institute of Stress (‘CIS’)**, founded in 1979 by Drs. Hans Selye and Richard Earle, offers programs, consultation and tools for workplaces and individuals, as well as certification training and distance education for professionals

Reach both organizations at: **[www.stresscanada.org](http://www.stresscanada.org)**

**Headliners: Hans Selye Foundation Targets 2009 Stress Casualties: A Science-based Agenda for Coaches and Trainers; The Hans Selye Foundation; 4/30/09**

Ongoing research by the Hans Selye Foundation, triggered by a series of economic traumas in Canada, pinpointed critical insights into the stress of radical worklife change and what does and does not work to reduce casualty risk factors

The following stats from the first quarter of 2009 were alarming:

- Depressive disorders 31% increase
- Generalized anxiety disorders 23% increase
- Insomnias 29% increase
- Marital & parenting challenges 19% increase
- Neuropathic pain 16% increase

While no one could have precisely predicted 2009's economic disasters, in 1996 the Selye Foundation did launch an R&D program to prepare an evidence-based response to it—in May 2009, the Foundation launched its ‘Resilience in Hyperchange’ strategy for treatment and prevention, focusing on the workplace

## **Physiology of Stress**

The Fight or Flight response is controlled (as are the other two phases) by the sympathetic and parasympathetic nervous systems

The sympathetic nervous system prepares the body for action and makes energy resources available

The sympathetic nervous system is activated to full force when we are focusing on external challenges (exciting OR burdensome)

The parasympathetic nervous system attempts to neutralize the effects of the sympathetic nervous system by restoring homeostasis

Both the sympathetic and parasympathetic nervous systems are controlled by the hypothalamus, a small section of the brain near the pituitary gland

When “danger” is imminent, signals are sent to the adrenal glands (located on top of the kidneys) via the sympathetic nervous system

Certain neurotransmitters (“chemical messengers”) called catecholamines are released into the system. Catecholamines activate the amygdala inside the brain which triggers an emotional response to the stressful event

The hippocampus is also signaled to store the emotionally loaded experience in long-term memory

During a stressful event, catecholamines also suppress activity in areas at the front of the brain concerned with short-term memory, concentration, inhibition, and rational thought

This sequence of mental events allows a person to react quickly in emergency situations but hinders a person’s ability to handle complex social or intellectual tasks and behaviors

If the “threat” lasts longer than a few seconds, a complicated series of hormones are released

During the resistance phase, the hypothalamus releases “corticotropin releasing hormone” (CRH) which triggers the secretion of “adrenocorticotropic hormone” (ACTH) from the pituitary gland

ACTH incites the production of **cortisol** from the adrenal glands

Cortisol’s main job is to increase energy supplied to vital systems such as the heart and brain

Cortisol does this by bettering the availability of blood glucose and by converting fat into energy

When cortisol is secreted, it causes a breakdown of muscle protein

Leads to release of amino acids (the “building blocks” of protein) into the bloodstream

These amino acids are then used by the liver to synthesize glucose for energy

Process raises the blood sugar level so the brain will have more glucose for energy

At the same time other tissues in the body decrease their use of glucose as fuel

Cortisol also leads to the release of fatty acids (from fat cells) for use by the muscle

One of the most important tasks of cortisol is to keep its own production under control by regulating CRH production (“feedback loop”)

### **Headliners: Smell has more power to stir emotions than sound or even sight according to a recent study out of Brown University in Providence, RI**

Psychology professor Rachel Herz, Ph.D. asked subjects to look at pictures of common childhood articles or to smell them

While viewers had no major mood change, sniffers reported intense emotional responses

Because odor, memory and emotion occur in the same area of the brain, smells are most likely to tap into meaningful recollections

### **Headliners: Hasbro, Inc. has bottled that fresh, just-out-of-the-can, "eau de PLAY-DOH" aroma**

‘One of PLAY-DOH compound’s most notable characteristics is its scent. When you open a can of PLAY-DOH compound, you are instantly transported back to childhood. What better way to celebrate the 50th birthday than by bottling the scent for adults everywhere to enjoy as a reminder of their youth.’--Leigh Anne Cappello, vice president of marketing for the PLAY-DOH brand

Order yours today: [www.perpetualkid.com](http://www.perpetualkid.com);

Retail price: \$19.99

Other cologne sprays available:

- Birthday Cake
- Dirt
- Sawdust
- Junior Mints
- Cotton candy
- Cannabis flower

### **Headliners of the Cortisol Variety**

Body's level of cortisol in the bloodstream displays what is known as a DIURNAL VARIATION--normal concentrations of cortisol vary throughout a 24-hour period

Cortisol levels in normal individuals are highest in the early morning around 6:00-8:00 AM and are lowest around midnight

Normal cortisol levels range from 6-23 mcg/dl (micrograms per deciliter)

Saliva sampling can be used as an index of blood cortisol levels (GCF holds promise)

Higher levels are likely associated with the increased physical and psychological stresses associated with certain conditions

**Headliners: An Investigation into the Effects of Gum Chewing on Mood and Cortisol Levels During Psychological Stress; Andrew Scholey, Ph.D.; lead researcher; Professor of Behavioral and Brain Sciences; Swinburne University in Melbourne, Australia; presented at the 2008 10th International Congress of Behavioral Medicine; results reported by Rick Naurert, PhD; senior news editor; reviewed by John M. Grohol, Psy.D.; appearing in www.PsychCentral.com; 9/1/08**

The study examined whether chewing gum is capable of reducing induced anxiety and/or acute psychological stress while participants performed a battery of 'multi-tasking' activities

The findings??? The use of chewing gum was associated with higher alertness, reduced anxiety and stress, and improvement in overall performance on multi-tasking activities

Additional findings: Stress levels were lower in participants who chewed gum—levels of salivary cortisol in gum chewers were lower than those of non-gum chewers by 16% during mild stress and nearly 12% in moderate stress

### **Stress Can Make You Sick!**

In the late 1980s, two professors (Drs. Sterling and Eyer) at the University of Pennsylvania coined the term "allostasis" (the ability to achieve stability through change)

"Allostatic load" is the price our bodies pay for the ability to adapt to stress

Allostatic systems respond to stress by initiating the adaptive response, sustaining it until the stress ceases, and then shutting it off (recovery)—the responses are initiated by an increase in circulating catecholamines from the autonomic nervous system and glucocorticoids from the adrenal cortex

Higher levels of allostatic load can lead to all sorts of physiological breakdowns

#### **Psychologic Effects**

Stress diminishes the quality of life by reducing feelings of pleasure and accomplishment

Relationships may become threatened

Chronic stress might develop into more serious problems (anxiety disorder, depression)

#### **Heart Disease**

Mental stress is as important a trigger for angina as physical stress and may even pose a HIGHER risk for serious cardiac events

Incidents of acute stress often precede sudden heart-related deaths

Because stress causes the release of fat into the bloodstream, blood-cholesterol levels rise

Sudden stress increases heart rate and causes arteries to CONSTRICT

Stress causes blood to become "stickier" (possibly to prepare for potential injury) which increases the incidence of blood clot formation

**Headliners: A Link Between Emotional Stress and Heart Attacks; Andrew Steptoe; psychologist; University College London; reported in Science News 3/11/06**

Researchers found that emotional stress raises systolic BP and heart rate and, in the chronically stressed individual, the time it takes to return to baseline levels is also increased

Research participants had samples drawn following stress-inducing tests and researchers found that accumulations of platelets bound to immune cells had roughly DOUBLED in the subjects who experienced heart attacks within 2 hours of a stressful event

**Headliners: In a massive, long-term study of 17,000 civil servants in Whitehall, Great Britain an almost unbelievable conclusion emerged:**

The status of a person's job was more able to predict their likelihood of a heart attack than:

- Obesity
- Smoking
- HBP

Someone in a low-grade job such as a janitor was nearly FOUR TIMES as likely to have a heart attack as a permanent secretary at the top of the heap

Indeed, even if the secretary was obese, hypertensive, or a smoker at a given age than a thin, non-smoking, low-blood- pressure janitor the secretary was STILL less likely to suffer a heart attack

Exactly the same result emerged from a similar study of a million employees of the Bell Telephone Company in the 1960s

### **Stroke**

Prolonged or frequent mental stress can cause an exaggerated increase in blood pressure—in time, this can lead to thickening of the carotid arteries (blockage of these arteries are the primary causes of stroke)

In a recent University of Texas Medical Branch at Galveston study, 2,478 elderly men and women were analyzed

The happiest 25% had HALF the number of strokes as their unhappy counterparts

### **Susceptibility to Diseases**

Sixty years ago the first evidence of stress-induced immunosuppression was discovered

Scientists have discovered that a period of stress will disrupt a wide variety of immune functions such as:

- Formation of new lymphocytes and their release into the circulation
- The time preexisting lymphocytes stay in the circulation
- The manufacture of antibodies in response to an infectious agent
- Communication among lymphocytes (“cytokines”)

The best-documented way in which such immune suppression occurs is via glucocorticoids (example: cortisol)

Glucocorticoids can cause shrinkage of the THYMUS GLAND

Most of the thymic tissue is made up of new lymphocytes that are ready to be secreted into the bloodstream

Additionally, glucocorticoids inhibit the release of certain cytokines (examples: INTERLEUKINS and INTERFERONS)

This inhibition of cytokines causes lymphocytes to be less responsive to an infectious challenge

Glucocorticoids have been shown to KILL lymphocytes by entering the cell and stimulating the production of a “suicide protein”

New studies are finding that stressors can suppress immunity independently of glucocorticoid secretion

Likely culprits include:

- Sympathetic nervous system hormones
- Beta-endorphin\*\*\*\*
- CRH

### **Digestive Problems**

Long-term stress can disrupt the GI system causing:

- Diarrhea
- Constipation
- Cramping
- Bloating
- Irritable bowel syndrome

### **Musculoskeletal Functions**

Muscles that would be used to “fight or flee” often become very tight until released by relaxation, massage, stretching, or exercise

One of the most common responses to stress and has led to expressions like “uptight” and “pain the neck” (and other places)

Symptoms associated with this stress response might include:

- Tension headaches
- TMJ disturbances
- Neck/shoulder pain or tension
- Insomnia
- Fatigue
- Loss of concentration
- Poor communication
- Memory, Concentration and Learning

The hippocampus, which is where memory cells in the brain are produced and stored, is highly activated during the fight or flight response

Prolonged exposure to cortisol is now believed to actually damage brain cells in the hippocampus

Although some memory loss occurs with age, stress may play an even more important role than simple aging

Very severe and acute stress that causes post-traumatic stress disorder (PTSD) is associated with physical changes in the brain (shrinkage of the hippocampus)

Severe stress may even break down the blood-brain barrier—a physiological mechanism that helps protect the brain from toxins, bacteria and other potentially harmful substances that may be carried in blood

### **Respiratory Distress**

With stress, breathing becomes more rapid to increase oxygen availability

Hyperventilation and some forms of asthma are associated with this stress response

**Headliners: Trees Help Lessen Asthma Rate; Jim Gibson, Canwest News Service; 5/7/08**

Children who live on tree-lined streets have lower rates of asthma, according to research in the Journal of Epidemiology and Community Health

Because asthma is the leading cause of hospital admission among children under 15, the researchers based their findings on asthma rates among children between four and five, and hospital admissions among children up to 15 in New York City

Asthma rates fell by almost a quarter for every increase in tree density equivalent to 343 trees per square kilometre!

The study authors caution that the findings do not mean the number of trees in any city is directly related to asthma rates—rather, trees may help curb asthma rates by encouraging children to play outdoors more or by improving air quality

### **Circulatory Changes**

Blood is directed away from the surface of the skin in the hands and feet (decreases chance that one would bleed to death when running away or fighting an attacker)

Blood is directed away from the GI and reproductive systems because of the low priority these systems have during a threat

Blood is directed toward the brain and major muscles to ensure survival

Symptoms associated with these stress-induced changes in the circulatory system include:

- Hypertension
- Cold hands and feet
- Stomach upset
- Migraine headaches
- Pre-ulcerous / ulcerous conditions
- Colitis
- Sexual dysfunction (70% in both men and women)

### **Pregnancy**

Pregnancy-related discomforts (such as nausea, fatigue, frequent urination, swelling, and backache) can be stressful—especially if the pregnant woman attempts to accomplish everything she did prior to pregnancy

### **Weight Problems**

Since the 1980's, a large body of medical literature has linked chronic stress and its consequences (anger, depression, binge-eating, etc.) to high levels of upper body fat

Eating often is “comforting” in times of stress

Provides “fuel” for fight or flight response

Visceral fat cells are very metabolically active and promote increases in BP, triglycerides, and blood glucose by rapidly dumping excessive fatty acids directly into the liver

Any fatty acids that the liver doesn't use return to the central fat cells, plumping them up even more

As central fat increases, it starts dumping fatty acids into the bloodstream ALL the time (not just during stress)

“The constant presence of fatty acids in the bloodstream is what puts people at risk for diabetes and heart disease.”--Raymond S. Niaura; Brown University

Other types of fat--particularly those deposits in the thighs and derriere--may actually PROTECT your heart

“Overweight women who carry most of their extra fat in their hips rather than their bellies...should not be at greater risk. If they have a smaller waist...[the fat] stays securely in the peripheral fat cells.”--Elissa Epel; Researcher in Psychology; University of California at San Francisco

The Good News (is there any??) Scientists do not know exactly how much central fat is too much  
Hereditary and psyche affect our sensitivity--and our bodies' responses--to stress  
Eating less and exercising more can help but sitting still and relaxing may be just as important for controlling your weight

**Headliners: Scientists from UCLA and the University of Pittsburgh were able to transform fat left over from liposuction into new cartilage, bones and muscles**

The discovery: Fat is a rich source of STEM CELLS

Stem cells are a primitive cell that can regenerate all types of tissue

Human embryos have been the most promising source of stem cells but many people oppose the use of fetal tissue

According to Dr. Marc Hedrick of UCLA School of Medicine: Fat stem cells will make it easier to reconstruct breast tissue for cancer patients

They could possibly be used for treating degenerative diseases of the brain, burns and orthopedic problems

“You can almost take any disease and think of a way these cells might be applied to treat it.”--Marc Hedrick, M.D.; Associate Professor; UCLA School of Medicine

The practical applications are not ready yet, but when they are, imagine being able to say: “I’m donating my fat to science!”--Source: Health September 2001

### **Stress and Nutrition**

**Headliners: If chronic stress is decreasing the supply of serotonin, it’s important to eat at least 2 oz of protein at every meal to ensure a steady supply of tryptophan in the bloodstream**

To move tryptophan into the brain, it must be paired with a carb

Welch researchers found that women who watched an anxiety-provoking movie clip and then ate chocolate had dramatically improved outlooks in TWO MINUTES

‘The flavonols in dark chocolate reverse the stress response—lowering blood pressure and relaxing the mind and body.’--Steven Pratt, M.D.; coauthor of SuperFoods Rx (2004)

### **Stress and Dental Health**

Studies are increasingly demonstrating a link between stress and periodontal diseases

Studies by Dr. Robert Genco (SUNY at Buffalo) found that high levels of financial stress and poor coping skills are likely to DOUBLE the chances of developing periodontal diseases

A therapy-resistant periodontal relationship between stress and disease has been established

**Headliners: Take It Easy & Reduce Tooth Loss!; Jeffrey Gross, DDS; associate clinical professor; Case School of Dental Medicine; as reported in Woman’s World; 6/23/08**

As many as 57% of recent studies link stress to periodontal diseases—the leading cause of tooth loss

‘A constant onslaught of cortisol depresses your body’s ability to kill off damaging bacteria in the mouth, plus it dampens your immune system’s ability to heal and repair tissue damage, allowing small gum problems to mushroom into bigger ones.’--Gross, J

Most experts believe that psychosocial factors--stress, moods, and anxiety--play an important role in the development of TMDs

While no strict “TMD personality” has been defined, persons suffering from TMDs report higher levels of stress, anxiety and depression than others

Efforts to control stress can have a positive impact on the development and duration of TMDs

**Headliners: Researcher finds link among stress, pain, and immune function**

Root canal procedure used as model to determine link

In a study reported in the July 2001 issue of Psychosomatic Medicine, researchers from the University of Florida and the University of Iowa found that short-term immune changes associated with root canal therapy were linked with the development of cold symptoms after the procedure

The patients who reported especially high levels of pain and stress were most likely to become sick later

Those patients who became ill had lower natural killer cell activity 30 minutes after the treatment and higher cortisol levels at the final blood draw

This study was one of the first to suggest a short-term pain and immune system change and subsequent health problems

'It is significant that the people in the study were healthy to begin with and experienced these short-term decrements in immune functions... ..We now need more research on nonpharmacological interventions prior to these procedures that will help to lessen patients' stress and anxiety and improve recovery.'

--Henrietta L. Logan, Ph.D.; Director; University of Florida College of Dentistry; Division of Public Health and Research

**Headliners: Lavender Calms Patients' Nerves at the Dentist; Chris Irvine; Telegraph UK; 9/12/08; accessed 2/25/09 at: <http://www.telegraph.co.uk/news/2822105>**

A little background: Lavender essential oil is said to have a calming scent and is often used for treating anxiety, migraines, and headaches—it is also believed to be an excellent remedy for various types of pain. Researchers from King's College London measured the anxiety levels of 340 patients using a questionnaire while they waited for a scheduled dental appointment.

Half were exposed to lavender aromatherapy during regular clinical visits over a 4-week period while the rest were not scented.

The study team found that lavender significantly reduced anxiety levels while at the clinic but made no difference on the patients' stress levels when thinking of future dental appointments.

Meet Dr. Susan Maples, DDS and her co-workers:

2101 N. Aurelius Rd., Ste. 1

Holt, MI.48842

P: (517) 694-0353 F: (517) 694-2001

Some of the complimentary services they offer:

- Cervical neck pillow
- Heated aromatherapy neck pillow
- Heated blanket
- Personal aromatherapy (essential oils are placed on the patient bib)
- Massaging dental chair pad
- Lavender scented hand warming mittens
- Foot and hand massages
- Paraffin hand treatment and jewelry cleaning
- Personal CD player with choice of music from their CD library including relaxation and nature music
- Aromatherapy with massage
- Relaxation in a Chiropractic massage chair
- Upper body massage with massage therapist 10-20 minutes
- Facial massage
- To finish the visit, a warm face towel is provided

Services offered for a fee:

Target massage 30 minutes

Full body massage 60 minutes

Hot stone massage 60 minutes

Rejuvenating facial treatment 30 minutes

### **Stress and Gender**

We are learning that men and women process stress differently and that childhood stress can lead to adult health problems.

**Headliners: A landmark UCLA study suggests that women respond to stress with a cascade of brain chemicals that cause them to make and maintain friendships with other women**

According to Laura Cousino Klein, PhD: "Until this study was published, scientists generally believed that when people experience stress, they trigger a hormonal cascade that revs the body to either stand and fight or flee as fast as possible."

It is now believed that women have a larger behavioral repertoire than just "fight or flight"

In fact, when the hormone oxytocin is released as part of the stress response in women, it buffers the fight or flight response and encourages her to tend to her children and gather with other women instead.

When she engages in this "tending and befriending" behavior, MORE oxytocin is released further countering stress and increasing the initial calming effect.

While ESTROGEN enhances the effect of oxytocin, TESTOSTERONE reduces the effects of oxytocin.

Study after study has found that social ties reduce the risk of disease by lowering blood pressure, heart rate, and cholesterol

“Every time [women] get overly busy with work and family, the first thing [they] do is let go of friendships with other women... That’s really a mistake.”--Ruthellen Josselson, PhD; Coauthor: *Best Friends: The Pleasures and Perils of Girls’ and Women’s Friendships* (1998)

**Headliners: Men versus Women Brain Study: Active Part of Brain during Stress ; As reported by Tamara Hardison; Associated Content; 11/21/09; accessed 2/25/09 at:**

**<http://www.associatedcontent.com>**

During and after performing stressful mathematics tasks, researchers at the University of Pennsylvania School of Medicine measured study participants’:

- Heart rates
- Cortisol levels
- Expressed stress levels
- Regional cerebral blood flow (‘CBF’)

The researchers found when men are under stress, CBF is increased in the right prefrontal cortex and decreased in the left orbitofrontal cortex

In contrast, women were found to have a more active limbic system—that part of the brain that processes data concerning emotions

The activated areas of the brain in BOTH men and women remained active well after the stressful task had been completed—however, WOMEN had a much stronger response

It has been shown for sometime that women have higher rates of depression and anxiety disorders than men. This study helps to explain why the rates...are higher among women. The study demonstrated that women respond to stressors with emotional responses PLUS their responses last a whole lot longer than men’s responses.--J.J. Wang, PhD; lead researcher for the study; assistant professor; departments of radiology and neurology; University of Pennsylvania School of Medicine

Nearly 40% of American women consider their daily stress level “severe”

Most burdensome issues included:

- Health concerns
- Family problems
- Financial pressures

Fewer than 30% of surveyed men complained of high stress levels

Men were just as stressed about money as women

30% more women were likely to use stress-busting treatments and products

Of the yoga practitioners surveyed, 72.2% are women; 27.8% are men

Stress may be implicated in DECREASED estrogen levels in women (important for cardiac health)

**Headliners: The Pleasure of Punishment: Imposing a penalty for unfair behavior activates a pleasure point in brain; Ernst Fehr; lead researcher; University of Zurich; Science; published by AAAS; 8/04**

A Swiss study set out to test whether the human brain might provide motivation for what they termed ‘altruistic punishment’—the desire to retaliate against those who have wronged us or otherwise broken social rules

Some key findings of the study:

- Some folks are willing to invest much more than others in punishing norm violators
- Imposing a ‘penalty’ activated a brain region called the dorsal striatum—which is involved with experiencing pleasure or satisfaction

Researchers only studied men—the team is also looking into investigating whether women’s brains work the same way

**Headliners: According to Wm. Frey II, Ph.D., operator of the Dry Eye and Tear Research Center at Region’s Hospital in St. Paul, Minnesota, CRYING is a natural stress reducer**

Dr. Frey describes crying as a ‘...purging of sorts, an excretive response similar to sweating or urinating.’ Crying would have stopped thousands of years ago if it had no biological purpose

Emotional tears contain the hormone PROLACTIN which is released from the pituitary gland in response to stress

Though tears triggered by an irritant also contain prolactin, the fact that emotional tears differ in protein composition from irritant tears is interesting

The expression 'for crying out loud' could well mean that the body is ridding itself of prolactin and its potential for peril

Although both men and women admit that crying is an emotional release, men are not as able to cry as women due to a variety of societal pressures

#### **Headliners: Dental phobias explored by gender**

More women than men are afraid of needles

Dentists are scary for 58% of Americans but only 22% are afraid of doctors--Source: Discovery Health Channel

#### **Stressbusters!!!!**

According to Stanford psychiatrist David Spiegel: "Living a stress-free life is not a reasonable goal. The goal is to deal with it actively and effectively."

Though that's easier for some people than others, studies suggest that anyone can learn to cope better

Some folks weather devastating experiences--captivity, torture, illness, loss--with uncanny serenity

By studying these serene people, researchers have found that they share distinctive habits of mind

- They tend to focus on immediate issues rather than global ones
- They find ways to rationalize (many view their ordeal as a special assignment from God)
- They tend to have an optimistic "explanatory style"
- Assume their troubles are temporary versus permanent
- Problems are specific versus universal
- Credit themselves when things go right while externalizing their failures

Even pessimists can learn to modulate the stress response with meditation, massage, exercise and social support

#### **Headliners: Nocebo versus Placebo????**

The nocebo effect has been identified as how negative beliefs or conditioned responses can have a profoundly negative impact on health

Opposite of the placebo effect in which a patient tends to see his/her condition improve even when given an inactive treatment

Joshua L. Straus, M.D., an assistant professor at Northwestern University Medical School in Chicago believes many adverse reactions to certain medications can be exacerbated by the nocebo effect

#### **Meditation**

Breathing techniques coupled with relaxing one muscle at a time ("scanning") has been shown to lower cortisol levels and decrease blood pressure and heart rate

Your Turn

- Take several slow deep breaths and exhale completely
- Scan
- Repeat a self-affirmation phase

#### **Headliners: Yoga Journal Releases 2008 'Yoga in America' Market Study; Harris Interactive Service Bureau on behalf of Yoga Journal ; 2/26/08**

The 2008 study indicates that 6.9% of U.S. adults, or 15.8 million people, practice yoga

Of current non-practitioners, nearly 8%, or 18.3 million Americans, say they are very or extremely interested in yoga; 4.1% of non-practitioners, or about 9.4 million people, say they will definitely try yoga within the next year

Americans spend \$5.7 billion a year on yoga classes and products, including equipment, clothing, vacations and media (DVDs, videos, books and magazines)—this figure represents an increase of 87% compared to the previous study in 2004

Homework Assignment

- Take time every day to sit quietly, in a darkened quiet room with your eyes closed
- Breathe deeply, scan and relax for 10 minutes

#### **Massage**

Over the past 25 years, researchers have shown that massage therapy can hasten weight gain in premature infants, improve lung function in asthmatics, and bolster immune function in HIV patients

**Headliners: Premature infants, massaged regularly for 10 days, gained 47% more weight than other preemies--and left the hospital 6 days earlier!**

Headliners: In a 1996 study, medical workers received 10 biweekly rubdowns and consistently outscored their unrubbed colleagues on timed math tests

Your Homework

- Seek out weekly massages--10 minutes to one hour--to lower stress and muscle tension
- Consider massage therapy in the dental setting

### **Social Support**

Having a friend's supportive presence in a stressful situation helps reduce anxiety by working with "anti-stress hormones" in the body

Researchers at the University of Zurich found that men in stressful situations performed significantly better with the presence of a best friend and a dose of oxytocin

How does a hormone that helps women give birth and breastfeed their babies ease men's anxiety during stressful experiences???

Oxytocin reduces the mother's cortisol stress response which enables her to:

- Focus on the baby without distraction
- Strengthen her immune system
- Encourage milk production
- Protect her baby from high cortisol levels in milk

The Swiss researchers found that cortisol and behavioral stress responses in men were suppressed when they had oxytocin nasal spray and, instead of the close presence of a baby, social support from their best friend--Reported by Reuters Health (New York); 3/01

Your Turn

- Seek support from friends and family when needed
- Do NOT take on the stressors of the world at the expense of your own health and well-being!
- Establish a supportive patient rapport to decrease anxiety in the dental setting

### **Exercise: #1 Stressbuster**

Exercise releases accumulated cortisol and stabilizes insulin levels

Combats low mood--a major side effect of stress

Promotes better sleep

Prevents weight gain (deep apple)

Exercise is known to increase the body's production of endorphins, improve oxygen supply to the brain and release tension from muscles

Your Turn

- Take the stairs
- Brisk 10 minute walks are very beneficial
- Turn off the television
- Play

Getting in touch with your system's rhythms will allow you to enter a trancelike state that can relax your mind and body as effectively as meditation

Your Turn

- Place one hand on your heart
- Feel for your heartbeat
- With the other hand, tap along with the beat
- The longer you tap, the more you'll find your body relaxing

### **Yawn and the World Yawns with You...**

As speedy, easy stressbusters, some people think yawns are unsurpassed

Trouble is, we generally associate them with boredom and fatigue

However, if one examines the many movements of a big, growly yawn, the health benefits are clear

- The urge to yawn is received
- The body lifts the arms overhead, stretching the shoulders and back
- The chest widens, opening up the lungs to make room for incoming oxygen (to be delivered to fatigued muscles)
- The inhale is followed by exhalation of bad air after which the body relaxes into a more easeful posture than before

In contrast, the 'polite yawn' is the least healthful:

- The body stays rigid
- The face further clenches to achieve the stifle
- A hand over the mouth hinders both the inhale and exhale

According to Rafael Pelayo, M.D., a neurologist at the Sleep Disorders Clinic and Research Center at Stanford University, yawns and sighs flush out and cleanse the lungs

Indeed, the yawn and its close cousin the sigh can be thought of as mini-yoga postures consisting of a stretch, a hold and a release done in harmony with the breath

Unlike so many things that we must remember to do--taking vitamins, attending exercise class--the sigh and yawn come to us unbidden

Let's appreciate them as our fastest and most portable tools for stress management!

#### **Turn off the TV**

Watching too much TV can TRIPLE our hunger for more possessions while reducing our personal contentment by about 5% for every hour a day we watch

#### **Believe in Yourself**

Across all ages and all groups, a solid belief in one's own abilities increases life satisfaction by about 40% and makes us happier in our home and work lives

#### **Enjoy What You Have**

People who have the most are only as likely to be happy as those who have the least

People who like what they have, however, are TWICE as likely to be happy as those who actually have the most

#### **Have Fun!**

Having fun is one of the five central factors in leading a satisfied life

Fun types are 20% more likely to feel happy on a daily basis and 36% more likely to feel comfortable with their age and stage in life

#### **Keyboards Stop Stress**

Playing a keyboard is so relaxing, its effects can be seen at the most basic cellular level

'Stress can activate the DNA markers linked to everything from cancer to ulcers, and playing the keyboard is THREE times more effective at shutting off stress than passively watching TV or reading.'--Dr.

Bickman; as reported in Woman's Worlds; 6/23/08

#### **According to a recent State University of New York (Buffalo) study, cuddling with your pet zaps stress!**

The reason??? Our pets love us unconditionally—putting us much more at ease and less guarded when we are with them

The study demonstrated that when our pets are around, we perform better on complicated tasks like solving math equations

Another bonus: Living with a cat lowers the risk of heart attack by 40%!!!

#### **'(S)He who laughs, lasts.'--Mary Pettibone Poole**

The power of a smile is priceless—it transcends race, age and gender to connect all living things

It is an indisputable fact that you can trigger activity in the "happiness centers" of the brain with a deliberate smile as surely as you can trigger a smile with happy thoughts

Every smile transmits nerve impulses from the facial muscles to the limbic system, a key emotional center in the brain

Because the limbic system is located next to the thinking part of the brain, it has been strongly suggested that this emotional center mixes reason and emotion

What works???? The key, experts agree, is to combat feelings of helplessness

Anything that fosters a sense of control lets you stop feeling like a victim and when that happens, your body stops treating itself like one

Your Turn

- List five things that you are happy about
- Share your list
- Make a difference

**THANK YOU!!!**

THANK YOU!

Cindy Crisler

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